

Sub E
(A) precipitating silica by reacting an acidifying agent with an alkali metal (M) silicate, by:

(i) providing an initial base stock, comprising at least a proportion of the total amount of the alkali metal silicate to be introduced into the reaction, and an electrolyte, the silicate concentration, expressed as SiO_2 in the said initial base stock being lower than 100 g/l and the electrolyte concentration in the said initial base stock being lower than 17 g/l;

D1
(ii) adding the acidifying agent to said base stock until a pH value of the reaction mixture of at least approximately 7 is obtained;

(iii) when only a proportion of the silicate is provided by the initial base stock, adding simultaneously the acidifying agent[,] and [if appropriate,] the remaining amount of the silicate to the reaction mixture;

(B) separating from the reaction mixture a precipitation cake which has a solids content of between 10 and 40%; and

(C) deagglomerating said cake to obtain a suspension of agglomerates having a median diameter D50 smaller than $5 \mu\text{m}$, whereby a suspension of low viscosity is provided.

REMARKS

Entry of the foregoing, examination and favorable reconsideration of the subject application in light of the above amendment and the following remarks, pursuant to and consistent with 37 C.F.R. § 1.112, are respectfully requested.

Claim 39 has been amended to clarify the claim language. Specifically, the phrase "if appropriate" has been deleted and the phrase "when only a proportion of the silicate is provided by the initial base stock" has been added. Support for this amendment may be found on page 9, lines 2-6 of the specification. Additionally, the claim has been amended to clarify verb tense. No new matter has been added.

In the interests of resolving the remaining issues which were pending in the parent application at the time this Continuing Prosecution Application was filed, Applicants have several comments to make regarding the prior rejections. Claims 29 and 31-46 were rejected in the parent application under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. However, rejections were only stated for three particular claims (claims 29, 31 and 39), the remainder being rejected presumedly for being dependent on a rejected claim. Also, although three claims have been rejected, the rejections in substance concern only two different issues: (1) whether a filter cake may be suspended without the addition of water (pertaining to rejections of claims 29, 31 and 39); and (2) whether the "if appropriate" terminology used in claim 39 is indefinite as to the nature of the choice to be made.

In the Official Action dated December 8, 1997, the Examiner stated the following with regard to the claims which now stand rejected:

- b) The steps of claims 31 and 39 do not appear to agree with the preambles; the effluent of step C will apparently yield a solid. A further step of adding water appears necessary (see claims 38 and 41). . .

- c) In claim 39, "if appropriate" is unclear as to the basis for determining it. . .
- e) Claim 29 is unclear as to what a filter cake is and how it can be present in a suspension.

See the Official Action, December 8, 1997, page 2.

In reply thereto, Applicant filed an Amendment whereby the claims were amended to further clarify Applicant's invention and the errors in the Examiner's rejection were discussed. In particular, it was pointed out to the Examiner that, although water may be added during suspension of the crumbled filter cake, this is not necessary because the precipitation cake contains water molecules usually referred to as "structural water" that occupy the spaces between the silica agglomerates, and which are released during the crumbling process thereby providing a medium for the suspension. *See* the Reply dated April 8, 1998, page 6. In addition, claim 39 was amended and remarks were entered to clarify that it would be "appropriate" to add the "remaining amount of silicate" as stated in claim 39 when only a proportion of the silicate is introduced in the initial base stock. *Id.*

A final Official Action dated June 12, 1998, was issued and the Examiner stated the following:

- b) Claim 29 is unclear as to how a "filter cake" can be present in a suspension.
- c) In claim 39, "if appropriate" is unclear as to the basis for determining it.
- d) The steps of claims 31 and 39 do not appear to agree with the preambles; the effluent of step C will apparently yield a solid. A further step of adding water appears necessary (see claims 38 and 41), or perhaps "dissolving" is intended for "deagglomerating."

The only remarks made in the June 12th Office Action in response to Applicant's arguments were as follows:

"The corrections intended have not been made to all the claims. Concerning 'if appropriate,' the term does not have the normal meaning of "if possible" which applicants apparently ascribe to it. Merely that it is possible to add a reagent does not mean that it is appropriate to do so." See the Official Action, June 12, 1998, page 3.

In the Reply filed thereafter, Applicant again stressed that water need not be added to the filter cake in order to create a suspension, and again argued that whether it was "appropriate" to add the remaining silicate as recited in claim 39 would be clear in view of the sequence and language of the steps of the claimed method.

An Advisory Action was issued on December 18, 1998, in which the Examiner maintained the rejections of claims 29, 31 and 39 under 35 U.S.C. §112, second paragraph.

The following comments were attached to the Advisory Action:

The argument concerning "if appropriate" is not persuasive. If all was initially added, then there is none to add later. If only part was added initially, then it appears (according to the arguments) that the rest is required to be added. In either event, there is no decision possible. In that "if appropriate" implies a choice to be made, the phrase is not appropriate in the claim since there is no choice to be made. It is not clear how one makes the choice that the claim implies is present and [the] specification [on] pgs 7-9 offer[s] no guidance or definition of what is appropriate.

Concerning the wet cake, it does not appear correct that mere crumbling of a solid material will create a solution. It appears that further addition of water is necessary. Water of hydration is generally not present in sufficient quantity so as to dissolve a material. Why would the water wait so long before it dissolves the solid? A Declaration is suggested and more data is needed. It is not clear what is compared, or what is being shown. The claims are not limited to the results alleged.

Having summarized the prosecution relating to the rejections under 35 U.S.C. §112, second paragraph, Applicants now address each of the rejections separately below.

- A. *Claims 29, 31 and 39 are not indefinite under 35 U.S.C. §112, second paragraph, for failing to include a step for the addition of water to the filter cake, because such a step is not necessary to accomplish the invention.*

The first sentence of the second paragraph of § 112 is essentially a requirement for precision and definiteness of claim language. If the scope of subject matter embraced by a claim is clear, and if the applicant has not otherwise indicated that he intends the claim to be of a different scope, then the claim does particularly point out and distinctly claim the subject matter which applicant regards as his invention. (With emphasis.) In re Hyatt, 218 USPQ 195, 197 (Fed. Cir. 1983).

The Examiner has set forth a rejection of claims 29, 31 and 39 under 35 U.S.C. §112, second paragraph, on the premise that the claimed methods require the addition of water. Applicants have consistently maintained that the addition of water is not required. To the extent that the scope of the claim covers suspensions whereby a filter cake is suspended using structural water alone as the Examiner has interpreted, the scope of the claims is correct.

Thus, it would appear that the Examiner is reading the claim correctly, because both the Examiner and Applicant agree that the claim encompasses a method of suspension wherein additional water need not be added. According to the case law cited above, *then*

the claim does particularly point out and distinctly claim the subject matter which applicant regards as his invention. In re Hyatt, 218 USPQ 195, 197 (Fed. Cir. 1983). There is no disagreement as to the meaning or scope of the claims, and the claims are, therefore, definite and precise.

It would seem then, that the Examiner intended to set forth a rejection under 35 U.S.C. §112, first paragraph, to the extent that he does not believe that the claimed method is enabled. However, the Examiner has not recited the correct statute, he has not backed up his assertion that the claimed suspensions may only be formed by the addition of water with any documentary evidence other than his own opinion, and he has not provided a proper analysis according to the standards established by the Board. See Ex Parte Forman, 230 USPQ 546, 547 (PTO Bd. App. & Int. 1986).

Applicants have explained to the Examiner how the structural water contained in precipitated silica can provide the medium for suspension upon crumbling. This fact is not new and is known in the art. For instance, as described in PCT WO 90/03330, page 4, lines 12-22:

The filter cake, although having the appearance of a moist solid, contains a relatively large amount of water. The water associated with the silica content of such filter cake has been referred to as structural water because it occupies the available space between the silica agglomerates and also the space inside the silica agglomerates. See, for example, U.S. Patent 4,157,920. When precipitated silicas hold a high percentage of water i.e., from about 70 to 85 weight percent, they have been referred to as high structure silicas. Precipitated silicas holding less than 70 weight percent, have been referred to as low structure silicas. (With emphasis.)

The Examiner has inquired in the Advisory Action, "Why would the water wait so long before it dissolves the solid?" In addition, the Examiner has requested additional data in the form of a declaration. Applicants respectfully submit that something that is known in the art does not require such explanation. A patent applicant need not include in the specification that which is already known and available to the public. Paperless Accounting v. Bay Area Rapid Transit System, 231 USPQ 649, 653 (Fed. Cir. 1986).

If the examiner's basis for questioning the sufficiency of the disclosure is reasonable the burden shifts to [Applicant] to come forward with evidence to rebut this challenge. (With emphasis.) Ex parte Dash, 27 USPQ2d 1481, 1484 (BPAI 1993). In view of the fact that the prior art discloses the nature of structural water, and that it may make up a "relatively large" proportion of the filter cake, the Examiner's allegation that "water of hydration is not generally present in sufficient quantity to dissolve a material" is certainly not reasonable in the absence of some extraneous evidence. See the Advisory Action, page 2.

In view of the fact that it appears that the Examiner has set forth an improper statute on which to base this rejection, and in view of the fact that the Examiner has not backed up his allegations with reasonable facts, particularly in view of what is already known in the art, it would seem that the rejection of claims 29, 31 and 39 for not specifying a step wherein water is added under 35 U.S.C. §112, second paragraph should be withdrawn. Moreover, before Applicant must come forward with additional data to support any allegation of non-enablement under 35 U.S.C. §112 first paragraph, the Examiner must

satisfy his burden of providing reasonable evidence why he does not believe that structural water may supply sufficient hydration for suspension of the filter cake in view of what is known in the art.

B. *Claim 39 is not indefinite under 35 U.S.C. §112, second paragraph, for the phrase "if appropriate."*

Claim 39 has been rejected under 35 U.S.C. §112, second paragraph, for alleged indefiniteness in the use of the phrase "if appropriate." As indicated above, it is the Examiner's position that the term implies that a choice is to be made where no choice is possible. In addition, it is the Examiner's opinion that the specification on pages 7-9 offers no guidance or definition of what is appropriate.

At the outset it is noted that claim 39 has been amended above in the interests of advancing prosecution. However, Applicants do not agree with the Examiner's rationale in making the rejection for the following reasons.

Applicants respectfully note the disclosure at page 8, lines 7-13, where it reads:

In this embodiment the operation is preferably carried out as follows:
a base stock which includes silicate as well as an electrolyte is formed first of all. The quantity of silicate present in the base stock may be either equal to the total quantity introduced into the reaction or may represent only a portion of this total quantity.

Applicants also respectfully note the disclosure at page 9, lines 2-6, where it reads:

Once this value has been reached, and in the case of an initial base stock including only a proportion of the total quantity of the silicate introduced, a simultaneous addition of acidifying agent and of the remaining quantity of silicate is then advantageously carried out.

Applicants fail to understand the Examiner's basis for the rejection in view of the above passages on pages 8 and 9. The Examiner's position is that there is no choice to be made in the method; yet, the specification clearly provides that the quantity of silicate present in the base stock may be either equal to the total quantity introduced into the reaction or may represent only a portion of this total quantity. The Examiner's position is that the specification does not describe what is appropriate. And yet, the specification clearly states that, **in the case of an initial base stock including only a proportion of the total quantity of the silicate introduced**, a simultaneous addition of acidifying agent and of the remaining quantity of silicate is then advantageously carried out in the last stage of the precipitation reaction.

It is Applicant's position that the claim language quite clearly reflects the choice to be made, and that the phrase "if appropriate" has a clear meaning in the claim, particularly when the claim is read in light of the disclosure. So long as the meaning of an expression is made reasonably clear and its use is consistent within a patent disclosure, an inventor is permitted to define the terms of his claims. Lear Siegler, Inc. v. Aeroquip Corporation, 221 USPQ 1025, 1031 (Fed. Cir. 1984). The definiteness of claim language employed must not be analyzed in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be interpreted by one having ordinary skill in the pertinent art. Ex Parte Moelands, 3 USPQ2d 1474, 1476 (PTO Bd App & Int. 1987).

In light of the fact that there is a choice to be made, contrary to the Examiner's assertion, and in light of the fact that the specification on pages 8-9 clearly describes the choice to be made, contrary to the Examiner's assertion, withdrawal of the rejection of claim 39 under 35 U.S.C. §112, second paragraph is respectfully requested.

Claims 22-37 and 39-45 stand rejected under 35 U.S.C. § 103(a), as being allegedly unpatentable over Chevallier et al. (PCT WO 90/03330). In the Official Action dated December 8, 1997, the Examiner stated the following:

Chevallier teaches in col. 2 lines 35-45, col.4 line 20-col. 5 line 25, col. 11 lines 5-20 and col. 22 lines 1-10 reacting silicate and acid (and optionally alumina) in the claimed concentrations, then adding more silicate and acid together to pH 4-6, filtering, ultrasonic deagglomeration and adding water to make a 4% silica solution. Chevallier differs in the silica concentration of the final product, however, suggests that a concentration of about 20% is desirable.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a silica product in the process of Chevallier having the claimed silica content because doing so makes a concentrated solution which is easy to handle, ship and use efficiently.

See the Official Action, December 8, 1997, pages 3-4.

In reply thereto, Applicant filed an Amendment whereby the claims were amended to further clarify Applicant's invention and the errors in the Examiner's rejection were discussed. In particular, it was pointed out to the Examiner that Chevallier does not teach a deagglomeration step as taught by the present invention so as to obtain a suspension with a particle size and low viscosity as claimed. *See* the Reply dated April 8, 1998, page 12.

A final Official Action dated June 12, 1998, was issued and the Examiner stated the following:

Chevallier teaches in col. 2 lines 35-45, col.4 line 20-col. 5 line 25, col. 11 lines 5-20 and col. 22 lines 1-10 reacting silicate and acid (and optionally alumina) in the claimed concentrations, then adding more silicate and acid together to pH 4-6, filtering, ultrasonic deagglomeration and adding water to make a 4% silica solution.

In further response to the Examiner's rejection, Applicants submitted a Reply to the Final Rejection setting forth comparative tests which showed that a suspension according to the invention exhibiting more than 50% of the initial weight of the silica in the supernatant after centrifuging at 7500 rpm for 30 minutes as claimed can only be obtained by ultrasonic deagglomeration, which are conditions and benefits not obvious from Chevallier.

However, in the Advisory Action dated January 16, 1998, the Examiner responded:

Chevalier teaches 24% solids content. The claims do not require the 7500 rpm centrifuging treatment.

Applicants respectfully traverse the Examiner's reasoning for the rejection for the following reasons.

In establishing a *prima facie* case of obviousness under 35 U.S.C. § 103, it is incumbent upon the Examiner to provide a reason *why* one of ordinary skill in the art would have been led to modify a prior art reference or to combine reference teachings to arrive at the claimed invention. To this end, the requisite motivation must stem from some teaching, suggestion or inference in the prior art as a whole or from the knowledge generally available to one of ordinary skill in the art and not from Applicants' disclosure. (With

emphasis.) *Ex parte Nesbit*, 25 U.S.P.Q.2d 1817, 1819 (B.P.A.I. 1992). Applicants submit that in the present case there is not motivation for performing the claimed method and arriving at the claimed silica suspensions as proposed by the Examiner, absent impermissible hindsight reconstruction.

U.S. Patent No. 5,403,570 to Chevallier et al. relates to precipitated silica in the shape of granules, powders or beads, intended as a reinforcing filter material for elastomeric/rubbery matrices, and which has both a good capacity for dispersion and mechanical strength. Thus, at the outset it is noted that Chevallier has an entirely different goal than that of the present invention, which is to produce silica suspensions.

Regardless of the different goal of Chevallier, it is conceded that Chevallier does include a disclosure concerning the suspension of the silica powders and granules taught therein, because, as described at col. 4, lines 53-59:

It should be appreciated that the resultant cake is not typically in a condition which would permit it to be sprayed, principally because of its excessively high viscosity. . The cake is then subjected to a known disintegrating operation. This may comprise transferring the cake to a colloidal or a ball-type mill.

It is the Examiner's position that Chevallier renders obvious the claimed invention because Chevallier teaches or rather suggests suspensions with the claimed percentage of silica, and the method of making such suspensions as taught in the present invention, including the ultrasonic deagglomeration step. Applicants respectfully note that, while Chevallier teaches a deagglomeration test for analyzing the capacity of the silica to

deagglomerate, at no point in Chevallier is it taught or implied that this process may be used in a method of making a silica suspension.

Chevallier describes the deagglomeration test beginning at col. 11, line 1, and continuing to line 40, where it is stated in part:

The capacity for deagglomeration of the powders according to the invention may be quantified by a specific deagglomeration test. . . The lower the value obtained for the mean diameter $\phi 50$, the higher will be the capacity for the silica for deagglomeration. The ratio of (10X volume of suspension introduced) to the optical density of the suspension detected by granulometry is also determined. . . This ratio indicates the proportion of fines, i.e., the proportion of particles smaller than 0.1 micron which are not detected by the granulometer. The higher this ratio, described as the ultrasonic deagglomeration factor (FD), the greater will be the capacity for the silica to deagglomerate.

Thus, Chevallier et al. discloses a method whereby ultrasonic deagglomeration is used to analyze the intrinsic properties of the silica powders and granules disclosed. At no point does Chevallier teach or even suggest that ultrasonic deagglomeration may be used to produce a silica suspension from the disclosed powders and granules. In fact, Chevallier suggests using known disintegration techniques such as transferring the cake to a colloidal or ball-type mill, which is clearly different than deagglomeration. The only way the Examiner could possibly envision a method whereby deagglomeration is used in forming a silica suspension would be to use Applicant's patent application in impermissible hindsight construction.

It is impermissible to first ascertain factually what Applicants did and then view the prior art in such a manner as to select from the random facts of that art only those which

may be modified and then utilized to reconstruct Applicants' invention from such prior art. In re Shuman, 150 USPQ 54, 57 (CCPA 1966). There must be something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. Lindemann v. Maschinenfabrik GMBH v. American Hoist & Derrick Co., 221 USPQ 481, 488 (Fed. Cir. 1984).

Chevallier does not suggest using deagglomeration to affect silica suspensions, therefor Chevallier et al. could not possibly suggest the advantages to be gained by deagglomeration in the stability of the suspensions thus obtained. As described in the data attached to Applicant's Reply to Office Action filed December 10, 1998, and also attached hereto in Appendix C, only after deagglomeration for five minutes does the viscosity of the suspension fall below 4×10^{-2} , and only after fifteen minutes of deagglomeration is a suspension obtained whereby more than 50% of the initial weight of the silica is present in the supernatant after centrifuging at 7500 rpm for 30 minutes (the "settling test" as described in the first paragraph of page 2 of the specification).

As discussed in the specification, the settling test is an indication of the stability of the suspension. See the sentence bridging pages 1-2. A suspension which has the property whereby over 50% of the silica is able to remain in the supernatant after 30 minutes of centrifugation is much more stable than one in which most of the silica precipitates during this test. Applicants have submitted data showing that ultrasonic deagglomeration is responsible for this unexpected and advantageous stability, and the fact that

deagglomeration leads to a suspension having such a property is in no way taught or even suggested by the disclosure of Chevallier.

The Examiner goes so far in the Advisory Action to argue that the 7500 rpm centrifuging treatment is not required by the claims, when in fact claim 22 specifically states that the claimed suspensions have the characteristic whereby "the amount of silica present in the supernatant obtained after centrifuging said suspension at 7500 revolutions per minute for 30 minutes represents more than 50% of the weight of the silica present in the suspension." Likewise, the independent method claim, claim 31, specifically states in the preamble that the claim is directed to a method of making an aqueous suspension of precipitated silica whereby "the amount of silica present in the supernatant obtained after centrifuging said suspension at 7500 revolutions per minute for 30 minutes represents more than 50% of the weight of the silica present in the suspension."

While the Examiner is correct that the method of making the claimed suspensions does not require a centrifugation step, the Examiner appears to misunderstand the fact that this "centrifuging treatment" is a test which serves to demonstrate the stability of the claimed suspensions and hence is a defining characteristic of the suspensions produced by the claimed method rather than a required step in the synthesis. To the extent that this characteristic stability may only be obtained by deagglomeration as demonstrated by the data presented to the Examiner and attached in Appendix C, the independent method claim indeed includes a deagglomeration step. *See* claim 31.

Thus, Chevallier does not teach deagglomeration to affect suspension of a silica filter cake. Rather, Chevallier only teaches the use of a deagglomeration test to characterize the silicas and powders disclosed therein. In fact, Chevallier recommends transferring the filter cake to a colloidal or ball mill to affect disintegration, and therefore could not possibly render obvious the unexpected and advantageous stability of suspensions created by deagglomerating a filter cake by ultrasound as shown by the settling test described in Applicant's disclosure and as claimed in the instant claims. In view of all this, it is respectfully submitted that a *prima facie* case of obviousness has not been presented. However, even if such a case had been made, the unexpected results of the present invention would be sufficient to overcome such a *prima facie* case of obviousness.

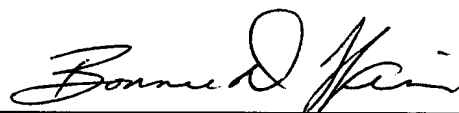
Accordingly, it is respectfully requested that the rejection of the claims under 35 U.S.C. § 103 over Chevallier et al. be withdrawn.

Application No. CPA of 09/132,231
Attorney's Docket No. 004900-148

It is Applicant's belief that this Preliminary Amendment resolves all the remaining rejections, and that a Notice of Allowance is next in order. If the Examiner would like to discuss the present Amendment or anything else pertaining to the application, he is invited to telephone the undersigned.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By: 
Bonnie D. Weiss
Registration No. 43,255

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620

Date: July 12, 1999